ABSTRACT

THESIS: Development of a High Throughput Small Molecule Screen Using *Staphylococcus aureus* Invasion of Cells

STUDENT: S. Ray Kenney

DEGREE: Master of Science

COLLEGE: Science and Humanities

DEPARTMENT: Biology

DATE: April, 2009

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Staphylococcus aureus is a common and versatile opportunistic pathogen in humans. Increases in the incidence of community acquired and nosocomial infections, coupled with the emergence of antibiotic resistant strains, are causing new treatment challenges for health care professionals. *S. aureus* readily binds to the endothelial cell surface and utilizes host cell endocytosis to evade host cell immune responses. Inhibition of endocytosis may cause S. aureus to remain unprotected at the host cell surface, allowing host immune systems and other therapeutics more time to clear an infection. Simvastatin inhibits host cell endocytosis. We hypothesize that using simvastatin to inhibit *S. aureus* invasion of host cells, a high throughput, small molecule screen can be developed. The high throughput screen will evaluate the National Institutes of Health small molecule library for compounds that better inhibit endocytosis. Additionally, 2-dimensional gel electrophoresis will be performed to elucidate the pathway simvastatin alters to inhibit endocytosis.